

Seal ETS
Compliance Assistance Questions and Answers
Friday, June 08, 2007

Q1. When does the ETS take effect?

A. The ETS became effective on May 22, 2007.

Q2. When do I have to submit a ventilation plan revision to address the sampling protocol?

A. Mine operators must submit a ventilation plan revision by June 21, 2007.

Q3. How long do I have to comply with the training requirements of the ETS?

A. Training for certified persons sampling sealed areas must be completed by June 21, 2007. Miners who construct or repair seals, certified persons who examine seals during construction and senior mine management officials who certify completed seals shall be trained prior to constructing, examining construction or repairing a seal.

Q4. Are PIB 06-16 and PIL I06-V-09 still in effect?

A. No, these documents were superseded by the ETS.

Q5. What about approved seals that are currently under construction? Do we have to stop working on these until we can get them re-approved in the ventilation plan?

A. No, you may complete any set of seals that is currently under construction. This construction must be completed by June 21, 2007. However, the mine operator must comply with the new seal requirements for construction examination and certification under § 75.337.

Q6. Does MSHA have a specific sampling method, type of equipment or other requirements for the sampling protocol?

A. No, the sampling methods, equipment and techniques must be appropriate for sampling conditions. Any sampling method should use generally accepted methods to assure that a representative sample is obtained from the sealed area and should employ detectors or analyses that are appropriate for the actual gas concentrations.

Q7. Do I have to sample the sealed atmosphere using both sampling pipes in each new seal?

A. During the 14-day sampling period, the sealed atmosphere must be sampled through both sampling pipes in each seal. To determine which sampling pipe in which seal should be used for monitoring under the protocol, mine operators should use the results of the 14-day sampling period. For example, if the results of the samples taken during the 14-day sampling period through

both sampling pipes are similar, then only one pipe may need to be used. Additionally, if sampling results for all seals in a set of seals are similar, then only one seal in that set of seals may need to be sampled. The District Manager may require additional sampling as necessary.

Q8. What does MSHA consider to be an inert atmosphere?

- A. An atmosphere is considered inert if it contains less than 10% oxygen, or less than 3% methane, or more than 20% methane.

Q9. I have built solid concrete block seals outby 20-psi alternative seals; do I only have to sample the area between the solid-block seals and the old 20-psi seals?

- A. Both the area between the solid concrete block seals and the 20-psi alternative seals and the area inby the old 20-psi seals must be monitored and maintained inert as specified in § 75.335(b). The area inby the 20-psi seals may be monitored through boreholes from the surface, from within the mine, or from another method that is approved by the District Manager.

Q10. The ETS does not discuss gob isolation stoppings. Will these installations still be required to meet the 20 psi standard?

- A. MSHA no longer has a 20 psi standard for new seal construction. The ETS applies to all seals. If at any time a gob isolation stopping is used as a seal or becomes a seal, then it must meet the ETS requirements. Sampling and monitoring must be addressed in the protocol as specified in the ETS and in the spontaneous combustion control plan submitted as part of the ventilation plan.

Q11. Section 75.336 states that an engineering design application shall, among other things, address a pressure-time curve. The preamble to the ETS states that pressure-time curves for the 50-psi and 120-psi seal strength requirements of ETS Section 75.335(a) are provided in the 2007 NIOSH Draft Report. Alternative pressure-time curves may be used for designs provided the pressure-time curves are submitted to MSHA's Office of Technical Support for approval. Can I use the 120-psi pressure time curve for 120-psi seals from the 2007 NIOSH Draft Report in my engineering design application?

- A. The 120 psi pressure-time curve in the 2007 NIOSH Draft Report may be used if atmospheric conditions within the sealed area are consistent with those assumed in the 2007 NIOSH Draft Report. The pressure-time curve provided by NIOSH for the 120-psi overpressure is based on an explosion occurring from an accumulation of methane located adjacent to the seal with an inert atmosphere in the rest of the sealed area. Therefore, if the 120-psi pressure-time curve from the 2007 NIOSH Draft Report is used, it must be specified in the design application that the mine operator will determine that an explosive mixture may be present only for a short distance behind the seal, but the rest of the atmosphere in the sealed area will be inert. MSHA expects mine operators to sample the sealed area for a sufficient length of time to determine if the design specifications have been implemented.

Alternatively, a different pressure-time curve may be used based on the possibility of an explosion within the sealed area creating an overpressure at

the seal. This condition can be represented by an instantaneous application of the 120-psi pressure followed by a constant loading period at 120 psi, as indicated in the pressure-time curve shown in the chart below. Therefore, if a pressure-time curve is used that is similar to the one in the chart; the design application would not need to address explosive mixtures in the sealed area. MSHA expects that mine operators will not have to sample the sealed area to determine if the design specifications were followed.

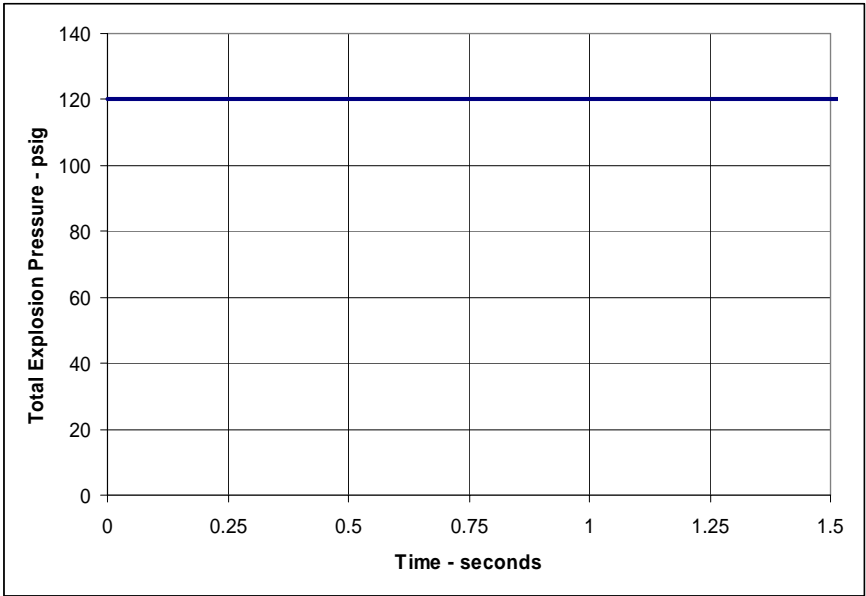


Figure 1. - 120 psi pressure-time curve.

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June 11, 2007

Q1. If during the sampling process methane concentrations are between 4.5 percent and 17.0 percent in a sealed area, and the approved plan requires the injection of an inert gas, what time frame will be allotted for the operator to complete this process?

A. Once the miners are withdrawn from the affected area or the action plan is implemented, the mine operator may take as long as necessary to inert the sealed area.

Q2. If a mine elects to inert, does the mine have to be evacuated during the inert process?

A. The mine operator must withdraw the miners from the affected area if the sealed atmosphere is in the explosive range.

Q3. If mines with large gobs containing several seal sets find one set with an explosive mixture and elect to install 120 psi seals in the affected set, will this bring the gob into compliance or will the entire gob require the additional 120 psi seals?

A. All seals around the affected sealed area would have to be at least 120 psi.

Q4. Have many operators received approval for a 120 psi seal design? If so, how can an operator get copies of the approval and seal design?

A. Two approved 120 psi designs are posted on the single-source web page.

Q5. For existing seals and future seals built to a 50 psi standard, it is understood that an "action plan" must be developed and approved in the vent plan that defines the steps to be taken when the area behind the seal is not inert. It would be helpful to have more specific guidance on what is expected in the action plan that "must provide protection to miners equivalent to withdrawal." Particularly, what corrective actions (other than inerting) can be taken when oxygen is > 10% and methane is between 3.0% and 4.5% or 17.0% and 20%, and what provides protection equivalent to withdrawal when methane is found to be between 4.5% and 17%?

A. For potentially explosive mixtures (oxygen is greater than 10% and methane is between 4.5 and 17%) miners have to be withdrawn from the affected area. For action levels between 3.0% and 4.5% methane and between 15.0% and 17.0% methane, the operator must undertake steps defined in the approved action

plan to diligently monitor and prevent the sealed area atmosphere from becoming explosive. Alternatively, the operator may elect to withdraw the miners except those referred to in section 104(c) of the 1977 Mine Act until the hazard is abated. Diligent monitoring may include hourly samples. Steps to prevent the sealed atmosphere from becoming explosive may include: repairing leaking seals, pressure balancing the mine ventilation around the sealed area, replacing seals with at least 120 psi seals, and injecting inert gas into the sealed area, or ventilate the abandoned area. Note opening and ventilating a sealed area will require approval by the District Manager.

Q6. Convergence is a well known, extremely important factor in seal strength in the majority of underground coal mines. The ETS only mentions that convergence must be considered in the design of a seal such that the seal won't yield to high levels of convergence. Most normal levels of convergence greatly enhance seal strengths and should not be ignored in seal design.

A. Convergence of mine entries takes time to develop and the recent history of fatal seal explosions all occurred soon after seal construction. Since the resistance to potential explosive forces is necessary soon after the seal construction is completed, seals must be designed to provide full design strength without relying on convergence effects. However, the seal design should establish the maximum allowable convergence a seal may undergo without affecting the structural integrity of the seal [ETS Preamble Sec. 75.336(a)(1)]. Most seals are built in stable areas of mines that are not subject to significant convergence. The recent history of fatal explosions in sealed areas have occurred very soon after the seals were built (Moura No. 2, Queensland, Australia, August 7, 1994, the explosion occurred about 22 hours after seal construction; Sago Mine, January 2, 2006, the explosion occurred within 22 days after seal construction; and Darby Mine No. 1, the explosion occurred 59 days after seal construction).

Q7. It is understood that a water drainage system capable of withstanding the applicable rated overpressure must be installed in each set of seals. The 120 PSI seal examples provided on the MSHA website do not show a 120 PSI water drainage system, additional guidance would be useful.

A. Please refer to 120 psi designs on single-source web page as we have added this information.

Q8. Can insulated cables be grounded rather than removed?

A. All insulated cables must be removed from the area to be sealed.

Q9. Does the designated professional engineer as outlined in 75.336(b) have responsibility to certify that the approved seal meets the mine conditions and is applicable at that mine? Does the professional engineer have to certify the physical construction of the seal?

- A. Yes. The mine operator must designate a professional engineer to conduct or have oversight of seal installations and certify that the provisions in the approved seal design have been addressed. A copy of this certification must be submitted to the District Manager.